Paper No. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte SANTHANA KRISHNAMACHARI

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Appeal No. 2001-2620
Application No. 09/110,613[1]

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ON BRIEF

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Before JERRY SMITH, FLEMING and SAADAT, Administrative Patent Judges.

SAADAT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the Examiner's final rejection of claims 1-20, which are all of the claims pending in this application.

We reverse.

[1] Application for patent filed July 6, 1998.

BACKGROUND

Appellant's invention relates to image retrieval from large databases based on determining a degree of similarity between a target image and each of a plurality of reference images. The similarity is measured based on the human perceptive system such that images that appear to be similar in color have a higher similarity measure than those with dissimilar colors. Similar colors in corresponding partitions in both the reference image and the target image are compared and associated with each other.

Representative independent claim 1 is reproduced as follows:

1. A method for comparing a first image to a second image comprising the steps of:

partitioning the first image into a first plurality of partitions and the second image into a second plurality of partitions, each partition of the first plurality of partitions having a corresponding partition of the second plurality of partitions,

determining proportions of colors in each of the partition of the first plurality of partitions and the second plurality of partitions,

determining a color distance between similar colors in each corresponding partition of the first and second pluralities of partitions,

comparing the proportions of the similar colors in each of the partition of the first plurality of partitions and the second plurality of partitions,

determining a shape-independent similarity measure between the first image and the second image that is based on the proportions of similar colors and the color distance.

The following references are relied on by the Examiner:

U.S. Patent

Hirata	5,781,899	Jul. 14, 1998 (filed Oct. 26, 1995)

European Published Patent Application

Hiroaki	EP 0 713 186 A1	May 22, 1996

Claims 1-3, 5-9 and 11-14 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Hirata.

Claims 4, 10 and 15-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hirata in view of Hiroaki.

We make reference to the answer (Paper No. 9, mailed June 5, 2001) for the Examiner's reasoning, and to the brief (Paper No. 8, filed March 28, 2001) and the reply brief (Paper No. 10, filed August 10, 2001) for Appellant's arguments thereagainst.

OPINION

Appellant argues that Hirata processes an image to create "zones" that define the shapes within the image (brief, page 4). Referring to Figure 2 of Hirata, Appellant points out that each image is partitioned into blocks (image B) and zones (image C) wherein each block is further processed to identify the one color that defines the block (id.). Appellant further argues that Hirata's shape-based comparison method does not include the claimed comparison of proportions of similar colors within each

partition (brief, page 5). Additionally, Appellant questions the Examiner's characterization of red, green and blue (RGB) encoding in Hirata as the claimed "determining a color distance between similar colors" and "comparing the proportions of similar colors" and argues that the claimed proportions of similar colors is not the same as the proportions of red, green and blue in a color (reply brief, pages 2 & 3).

In response to Appellant's arguments, the Examiner asserts that the claimed proportion of similar colors in the partitions is equivalent to the RGB proportions of similar colors in the two zones of Hirata (answer, page 9). The Examiner further asserts that the image comparison of Hirata is based on both color and shape of the zones and includes a comparison of proportions of similar colors as the proportions of red, green and blue in each color (answer, pages 9 & 10). The Examiner adds that since any color can be expressed or divided to RGB proportions, the color value of each block may be expressed in terms of RGB proportions (answer, page 10).

A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference. In re Paulsen, 30 F.3d 1475, 1478-79, 31 USPQ2d 1671, 1673 (Fed. Cir. 1994). See also Atlas

Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999).

We observe that Hirata relates to an image storage and management system which, as depicted in Figure 6, includes a zone integrating section, a color information matching deriving section and a shape matching section (col. 9, lines 49-55). Images 71A and 71B, which are generated from the image index storage and the inquiry image input, are integrated repeatedly until each similar zone in these images corresponds to each other (Figure 7; col. 9, lines 56-65). However, Hirata starts with measuring the similarity of the shapes of the integrated zones (col 10, lines 6-8) and then measures the similarity of colors of the integrated zones as indicated by a distance of their RGB values (col. 10, lines 19-26). Therefore, the image matching in Hirata is performed by a sum of scores of the similarity of the shape and color in each zone (col. 10, lines 33-41).

We disagree with the Examiner that the same part of the reference (col. 10, lines 19-55 and col. 13, lines 14-32) corresponds to the recited steps of "determining a color distance between similar colors in each corresponding partition" and "comparing the proportions of the similar colors in each of the partitions." What a reference teaches is a question of fact. In re Baird, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994)

(citing In re Beattie, 974 F.2d 1309, 1311, 24 USPQ2d 1040, 1041 (Fed. Cir. 1992)). Here the Examiner characterizes the difference in the RGB encoding of each zone in the prior art as determining a color distance between similar colors which will result in comparing the proportions of the same red, green and blue components of each partition that is recited in the step of "comparing the proportions of the similar colors." As pointed out by Appellant (reply brief, page 4), this interpretation of the RGB value as the color distance between similar colors results in inconsistent reading of the "color difference" and "similar colors." In that regard, if the Examiner urges that the proportions of colors in each partition is determined according to their RGB encoding, a color distance between similar colors in each partition will require determining a color distance between similar colors such as red components which, as argued by Appellant (id.), is meaningless.

In view of the discussion above, we find that the claimed steps of "determining a color distance between similar colors in each corresponding partition" and "comparing the proportions of the similar colors in each of the partitions" are absent in the method for color information matching of Hirata. Claim 7 includes similar limitations related to the similarity measures determined by the proportions of similar colors and the color

differences in each partition which, as discussed above with respect to claim 1, are absent in Hirata. Accordingly, since the Examiner has failed to meet the burden of providing a prima facie case of anticipation, the 35 U.S.C. § 102 rejection of claims 1 and 7 as well as their dependent claim 2, 3, 5, 6, 8, 9 and 11-14 over Hirata cannot be sustained.

Turning now to the 35 U.S.C. § 103 rejection of claims 4, 10 and 15-20, we note that the Examiner further relies on Hiroaki for teaching the step of determining a set of color centers and the use of a sorter (answer, pages 7 & 8). Hiroaki relates to a method for image retrieval wherein color, shape and positional relationship of regions in images are compared (abstract). However, similar to Hirata, the color comparison in Hiroaki is performed using the RGB encoding and values (page 6, lines 25-33). Therefore, since the Examiner has not pointed to any disclosure in Hiroaki that relates to the similarity measures determined by the proportions of similar colors and the color differences in each partition, as recited in claim 15, the deficiencies of Hirata as discussed above with respect to claims 1,7 has not been overcome. Accordingly, we do not sustain the 35 U.S.C. § 103 rejection of claims 4, 10 and 15-20 over Hirata and Hiroaki.

CONCLUSION

In view of the foregoing, the decision of the Examiner to reject claims 1-3, 5-9 and 11-14 under 35 U.S.C. § 102 and claims 4, 10 and 15-20 under 35 U.S.C. § 103 is reversed.

REVERSED

JERRY SMITH Administrative Patent Judge	)
MICHAEL R. FLEMING Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
MAHSHID D. SAADAT Administrative Patent Judge	)

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